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(71) Applicant(s)
Scapa Group Plc

(Incorporated in the United Kingdom)

Oakfield House, 93 Preston New Road, BLACKBURN, Lancashire, BB2 6AY, United Kingdom

(72) Inventor(s)
Craig Valentine
Ian Christison Sayers

(74) Agent and/or Address for Service
Wilson Gunn M'Caw & Co.
41-51 Royal Exchange, Cross Street, MANCHESTER, M2 7BD, United Kingdom

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WO 91/16492 A US 5207873 A US 4251928 A

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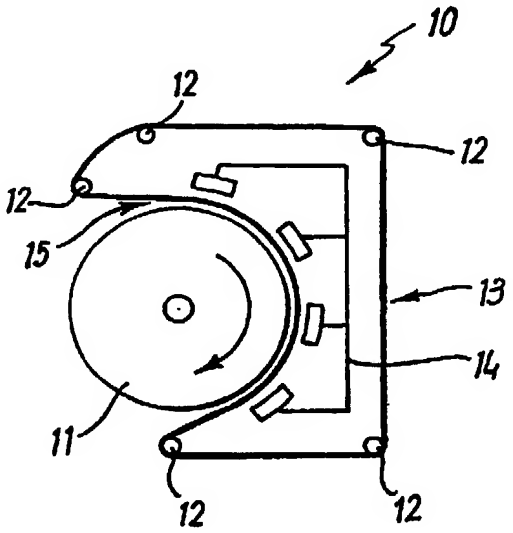
(54) Papermachine shoe press belt fabric with polymer coating including a thixotrope

(57) A shoe press belt for a papermachine includes a base fabric with a polymer coating including a thixotrope. The thixotrope may be aramid fibres or fused silica. The coating is applied by feeding the coating from a nozzle into the nip 15 between the base cloth 13 and rotating drum 11.



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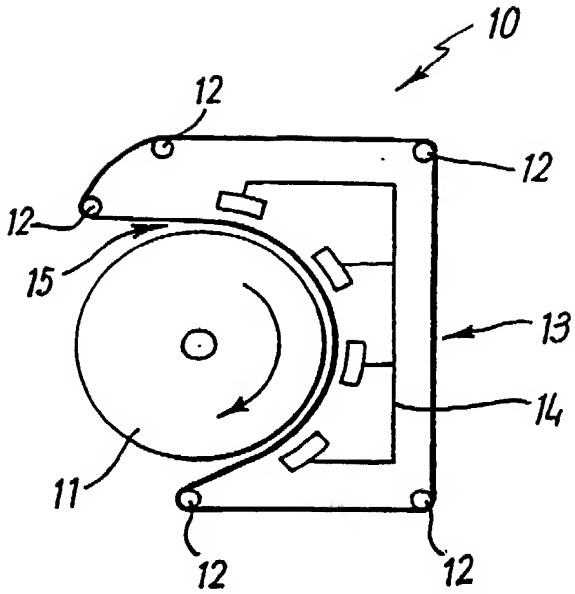
At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.



PAPERMACHINE CLOTHING

The present invention relates to papermachine clothing and particularly but not exclusively to shoe press belts.

One form of papermachine clothing comprises a woven or non woven base cloth to which a coating of polymer is applied. In one method of manufacture an endless base cloth is fed around a series of rollers and around a part of a horizontally mounted rotatable drum. As the belt passes around the drum heat-softened polymer is applied into the nip between the belt and the drum.

In this process there is a tendency for the heat softened polymer to slump as it approaches the base of the drum. This is undesirable in that the polymeric layer applied to the belt is of non uniform thickness.

The present invention has been made from a consideration of this problem.

According to a first aspect of the present invention there is provided a method of making papermachine clothing comprising the step of feeding a base cloth over a rotating body and applying a polymer coating to the base cloth as the base cloth is fed over the rotating body, wherein the polymer coating is impregnated with a thixotrope. The thixotrope acts to increase the viscosity of the "fluid" polymer once applied to the base cloth.

Surprisingly the toughness, modulus and abrasion resistance of the papermachine clothing is significantly improved by incorporation of the thixotrope into the polymer coating.

According to a second aspect of the present invention there is provided papermachine clothing having a coating of polymer thereon, wherein the polymer is impregnated with a thixotrope.

Aramid fibres such as KEVLAR (RTM) (para-phenylene terephthalamide) are preferred. The fibres are preferably chopped into lengths in the range from 0.8mm to 4.00mm and preferably have a diameter in the order of 12μm. KEVLAR (RTM) is particularly preferred in that the random orientation and physical entanglement of the fibres and fibrils thereof align in the direction of applied shear thus increasing the viscosity of the polymer. Alternatively fused silica may be used as a thixotrope.

The polymer is preferably thermoset. Polyurethane is preferred.

In order that the present invention may be more readily understood a specific embodiment thereof will now be described by way of example only with reference to the single accompanying drawing which shows one apparatus for making papermachine clothing in accordance with the present invention.

Referring to the drawing an apparatus 10 for

making papermachine clothing such as a shoe press belt comprises a horizontally mounted rotatable drum 11 and a plurality of rollers 12 which define a path over which an endless base cloth 13 travels. A series of infra-red heaters 14 are provided adjacent the drum 11 on the side of the base cloth 13 which is remote from the drum 11. A polyurethane coating may be applied to the base cloth 13 by utilising a feed nozzle to project the heat softened polymer into the nip 15 between the base cloth 13 and the top of the drum 11. The polyurethane coating is impregnated with chopped aramid fibres in order to prevent sagging of the polymer on the drum and to improve the abrasion resistance of the belt.

In order to impregnate the polyurethane coating with the chopped aramid fibres the fibres are added in substantially equal amounts to the thermoset precursor material. The aramid containing precursors (e.g. polyol and isocyanate) are mixed immediately prior to applying the impregnated coating to the base cloth. The amount of aramid fibre added is preferably less than 3% by weight.

The strength of a prior art polyurethane coated belt "A" was tested. Similarly the strength of a belt incorporating 0.17% KEVLAR (RTM) was tested. The results are set out below.

	Average Strength (Kg/2.5cm)
'A' Polyurethane (Prior Art)	91.3
'B' Polyurethane + 0.17% Kevlar	94.5

It can be seen that the incorporation of very small amounts of KEVLAR fibres significantly increases the strength of the press belt.

It is to be understood that the above described embodiment is by way of illustration only. Many modifications and variations are possible.

CLAIMS

1. A method of making papermachine clothing comprising the step of feeding a base cloth over a rotating body and applying a polymer coating to the base cloth as the base cloth is fed over the rotating body, wherein the polymer coating is impregnated with a thixotrope.

2. A method of making papermachine clothing as claimed in claim 1, wherein the thixotrope comprises an aramid.

3. A method of making papermachine clothing as claimed in claim 1 or claim 2, wherein the thixotrope comprises aramid fibres.

4. A method of making papermachine clothing as claimed in claim 3, wherein the length of the fibres is in the range from 0.8mm to 4.0mm.

5. A method of making papermachine clothing as claimed in claim 3 or claim 4, wherein the fibres have a diameter of substantially 12μm.

6. A method of making papermachine clothing as claimed in claim 1, wherein the thixotrope comprises fused silica.

7. A method of making papermachine clothing as claimed in any preceding claim, wherein the polymer is a thermosetting polymer.

8. A method as claimed in any preceding claim, wherein the polymer comprises polyurethane.

9. A method of making a shoe press belt using the method of any of claims 1 to 8.

10. Papermachine clothing comprising a base cloth having a polymer coating thereon, wherein the polymer is impregnated

with a thixotrope.

11. Papermachine clothing as claimed in claim 10, wherein the thixotrope comprises an aramid.

12. Papermachine clothing as claimed in claim 10 or claim 11, wherein the thixotrope comprises aramid fibres.

13. Papermachine clothing as claimed in claim 12, wherein the length of the fibres is in the range from 0.08mm to 4.0mm.

14. Papermachine clothing as claimed in claim 12 or claim 13, wherein the fibres have a diameter of substantially 12 μm.

15. Papermachine clothing as claimed in claim 10, wherein the thixotrope comprises fused silica.

16. Papermachine clothing as claimed in any of claims 10 to 15, wherein the polymer is thermoset.

17. Papermachine clothing as claimed in any of claims 10 to 15, wherein the polymer comprises polyurethane.

18. The use of the papermachine clothing of any of claims 10 to 17 as a shoe press belt.

19. A method of making papermachine clothing substantially as defined herein with reference to the accompanying drawing.

20. Papermachine clothing substantially as defined herein with reference to the accompanying drawing.

Patents Act 1977 Examiner's report to the Comptroller under Section 17 (The search report)	Application number GB 9325608.9
Relevant Technical Fields (i) UK Cl (Ed.N) B2E (EM); D2A (AJA) (ii) Int Cl (Ed.6) D21F	Search Examiner MR G J W RUSSELL
	Date of completion of Search 20 FEBRUARY 1995
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii)	Documents considered relevant following a search in respect of Claims :- 1-20

Categories of documents

X:	Document indicating lack of novelty or of inventive step.	P:	Document published on or after the declared priority date but before the filing date of the present application.
Y:	Document indicating lack of inventive step if combined with one or more other documents of the same category.	E:	Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A:	Document indicating technological background and/or state of the art.	&:	Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
A	WO 91/16492	(PROCTER & GAMBLE) see page 45 line 28 - page 47 line 11	1
X	US 5207873	(HUYCK) see column 2 lines 41-43	10
X	US 4251928	(ASTEN) see column 4 line 62 - column 5 line 14	10

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